

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:  
BARRIGAR INTELLECTUAL PROPERTY  
LAW  
1500 - 333 Seymour Street  
VANCOUVER, British Columbia  
Canada, V6B 5A6

Date of mailing      04 May 2005 (04-05-2005)  
(day/month/year)

Applicant's or agent's file reference  
KL001/2977WO

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
**PCT/CA2004/002183**

International filing date (day/month/year)  
22 December 2004 (22-12-2004)

Priority date (day/month/year)  
30 December 2003 (30-12-2003)

International Patent Classification (IPC) or both national classification and IPC  
IPC: F01K 27/00, F17D 1/04, F17C 7/00, F02C 1/02, C01B 3/02, C25B 1/00, H02K 7/00

Applicant  
MCDONALD DUNCAN ET AL

1. This opinion contains indications relating to the following items :

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Box No. I    | Basis of the opinion  |
| <input type="checkbox"/> Box No. II              | Priority  |
| <input type="checkbox"/> Box No. III             | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/> Box No. IV              | Lack of unity of invention  |
| <input checked="" type="checkbox"/> Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement. |
| <input type="checkbox"/> Box No. VI              | Certain documents cited   |
| <input checked="" type="checkbox"/> Box No. VII  | Certain defects in the international application  |
| <input checked="" type="checkbox"/> Box No. VIII | Certain observations on the international application   |

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/CA  
Canadian Intellectual Property Office  
Place du Portage I, C114 - 1st Floor, Box PCT  
50 Victoria Street  
Gatineau, Quebec K1A 0C9  
Facsimile No.: 001(819)953-2476

Authorized officer

Sylvestre Michael Bishop (819) 953-9813

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1 to 58</u>	YES
	Claims	<u>none</u>	NO
Inventive step (IS)	Claims	<u>none</u>	YES
	Claims	<u>1 to 58</u>	NO
Industrial applicability (IA)	Claims	<u>1 to 58</u>	YES
	Claims	<u>none</u>	NO

2. Citations and explanations :

D1:CA 1,274,399 A1 (KRYOS ENERGY INC.)	25 September 1990	(25-09-1990)
D2:US 6,196,021 B1 (WISSOLIK)	06 March 2001	(06-03-2001)
D3:US 4,555,637 A (ACD INC.)	26 November 1985	(26-11-1985)
D4:US 5,003,782 A (KUCERIJA)	02 April 1991	(02-04-1991)
D5:CA 2,128,349 AA (ORMAT INDUSTRIES LTD.)	23 January 1995	(23-01-1995)
D6:CA 2,212,138 AA (LUNDBERG)	02 february 1998	(02-02-1998)
D7:EP 0 596 143 A1 (AKTSIONERNOE OBSHESTVO "KRYOKOR")	11 May 1994	(11-05-1994)
D8:US 6,167,692 B1 (GENERAL ELECTRIC CO.)	02 January 2001	(02-01-2001)
D9:US 6,638,413 B1 (LECTRO PRESS INC.)	28 October 2003	(23-10-1003)
D10:US 5,112,463 A (XUEMING)	12 May 1992	(12-05-1992)

Novelty (N)

Claims 1 to 58 meet the requirements of PCT Article 33(2).

Inventive step (IS)

Claims 1 to 58 fail to meet the requirements of PCT Article 33(3)

D1 is considered to define the most relevant general state of the art with respect to claims 1 to 6, 22 to 25, 33 to 40, 42, 52, 53, 57 and 58, by disclosing an apparatus (system) and method for reducing the pressure in a gas pipeline (carrier line) and using the resulting energy for other purposes. The apparatus (system) and method comprise expander means (flow converter, expansion engine and turbo-expander) to reduce the pressure (pressure drop) in a gas pipeline; an electrical generator mechanically linked to the expander means; heating means (heat source); and methanol injection means (pump) connected to a methanol tank (abstract; figure 1; and claims 1 to 10).

(continued in Supplemental Box)

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**Box No. VII**      **Certain defects in the international application**

The following defects in the form or contents of the international application have been noted :

**Description**

The description does not meet the requirements of PCT Article 5. The "summary of the invention" in the description is vague and unclear due to the numerous statements that add features to the described embodiments. These statements, which are "in another aspect"; "in yet a further aspect"; "in yet another aspect"; and "in a second aspect", render the comprehension of the possible embodiments difficult.

**Drawings**

Figures 1 to 5 do not meet the requirements of PCT Rules 11.13(e), which requires that all numbers appearing on the drawing to be simple and clear.

**Abstract**

The abstract does not meet the requirements of Rule 8(d) which states that each main technical feature mentioned in the abstract and illustrated by drawings should be followed by a reference sign placed between parentheses.

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**Box No. VIII**      **Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made :

**Claims**

Claims 1, 24, 34 and 36 are indefinite and do not comply with PCT Article 6. The inclusion of "such as" causes ambiguity.

Claims 1, 16, 17, 19, 20, 21, 39, 51, 52, 54, 55 and 56 are indefinite and do not comply with PCT Article 6. These claims fail to define the position and relation of the water extractor with respect to the components and parts of the invention.

Claims 1, 5, 18, 34, 36 and 50 are indefinite and do not comply with PCT Article 6. The double inclusion of any element is not permissible in the claims. The expressions:

    "processed gas" (claims 1 and 5);  
    "primary stream" (claim 18, line 11);  
    "carrier line" (claims 34 and 36); and  
    "power grid" (claim 50, line 2);

have been defined previously in the claims. The aforementioned expressions should therefore be referred to using a definite article.

Claim 2 is indefinite and does not comply with PCT Article 6. The expression "... to said flow converter to said carrier line ..." is vague and unclear.

Claims 18 and 53 are indefinite and do not comply with PCT Article 6. The expression "... for injecting methanol into a primary stream, a methanol separation tank, said methanol separation tank in ..." is vague and unclear with respect to the manner by which it introduces the methanol separation tank.

Claims 50 and 57 do not comply with PCT Rule 6.4. Dependent claims must refer to preceding claims and not to themselves.

**Description**

In accordance with PCT Article 5, all documents referred to in the description of an application must be available to the public. Reference to the document on page 13, line 25 must be deleted or replaced by its corresponding patent number or publication number. This authority was unable, using Delphion, USPTO and Espacenet, to locate this document.

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of: **BOX No. V**

**2. Citations and explanations:**

D2, D3, D4, D5, D6, D7 and D8 are considered independently to define the most relevant general state of the art with respect to claims 1 to 6, 22 to 25, 33 to 40, 42, 57 and 58, by disclosing an apparatus (system) and method for reducing the pressure in a gas pipeline (carrier line) and using the resulting energy for other purposes. The apparatus (system) and method comprise expander means (flow converter, expansion engine and turbo-expander) to reduce the pressure (pressure drop) in a gas pipeline; an electrical generator mechanically linked to the expander means; and heating means (heat source) (for D2, see abstract; figures 1 to 6; and claims 1 to 21; for D3, see abstract; figures 1 and 2; and claims 1 to 9; for D4, see abstract; figures 1 to 3; and claims 1 to 3; for D5, see abstract; figures 1 to 3; and claims 1 to 11; for D6, see abstract; figures 1 to 12; and claims 1 to 22; for D7, see abstract; figure 1; and claims 1 and 2; and for D8, see abstract; figures 1 to 2; and claims 1 to 16).

Claims 1 to 6, 22 to 25, 33 to 40, 42, 52, 53, 57 and 58 differ from D1, D2, D3, D4, D5, D6, D7 and D8, by having the apparatus (system) and method for reducing the pressure in a gas pipeline (carrier line) utilising the resulting energy from the expander means (flow converter, expansion engine and turbo-expander) to energize a processed gas generator which will produce (electrolyzation) and store a processed gas (hydrogen) for purpose such as fuelling hydrogen fuelled vehicles, however, this additional utilization of the energy from the expander means is considered obvious in view of D9 and D10, which both disclose production (electrolyzation) and storage of a processed gas (hydrogen) through electrical means (for D9, see abstract; figures 1 to 5; and claims 1 to 32; for D10, see abstract; figures 1 to 7; and claims 1 to 6).

The addition of the "water extractor" in claims 1 and 39 is considered irrelevant since the claims fail to define the relation of the water extractor with all the other components and parts of the invention. This defect will be further discussed in **BOX No. VIII**.

Claims 7 to 21, 26 to 32, 41, 43 to 51, 54, 55 and 56 disclose features which are considered obvious in view of the common general knowledge and would be well known to an un inventive skilled technician, hence these claims are not considered inventive.

**Industrial applicability (IA)**

Claims 1 to 58 meet the requirements of PCT Article 33(4).